

Application No. 10/092, .J
Paper Dated: December 9, 2003
In Reply to USPTO Correspondence of September 9, 2003
Attorney Docket No. 3826-020123

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-28 (cancelled)

29. (previously presented) A meter register, comprising:
a register body having a rotatable drive shaft coupled thereto;
a drive gear attached to said drive shaft, at least one follower gear rotatably attached to said register body and coupled with said drive gear; and
an antenna, comprising a first electrically conductive sheet, a second electrically conductive sheet, and an axially extending leg electrically connected to said first electrically conductive sheet and said second electrically conductive sheet, said first electrically conductive sheet spaced an axial distance away from said second electrically conductive sheet wherein at least a portion of said register body is sandwiched between said first electrically conductive sheet and said second electrically conductive sheet.

30. (previously presented) A meter register as claimed in claim 29, further comprising an odometer coupled to said drive gear and at least one follower gear.

31. (previously presented) A meter register as claimed in claim 30, wherein said rotatable drive shaft has a magnetic member attached at a first end and an indicator which attaches at a second end and wherein said register drive shaft extends along a longitudinal axis and said first electrically conductive sheet is contained in a first plane and said second electrically conductive sheet is contained in a second plane, the longitudinal axis being normal to the first plane and the second plane.

32. (previously presented) A meter register as claimed in claim 30, further comprising a sensing follower gear rotatably secured to said body and coaxing with said drive gear, said sensing follower gear rotates about a sensing axis and a sensing magnet

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coacting with said sensing follower gear and radially spaced from the sensing axis whereby when said sensing follower gear rotates about the sensing axis, said magnet rotates about the sensing axis in a rotating plane, and a first magnetically activated switch attached to said body spaced an axial distance from said rotating magnet plane, whereby when said magnet and said first magnetically activated switch are radially aligned, said first magnetically activated switch is in a first state and when said magnet is not radially aligned with said first magnetically activated switch, said magnetically activated switch is in a second state.

33. (previously presented) A meter register as claimed in claim 32, further comprising a second magnetically activated switch attached to said body spaced an axial distance away from the rotating magnet plane, said second magnetically activated switch is spaced circumferentially from said first magnetically activated switch, whereby when said second magnetically activated switch and said magnet are radially aligned, said first magnetically activated switch is in a first state and when said magnet is not radially aligned with said second magnetically activated switch, said second magnetically activated switch is in a second state, and wherein said magnet is adapted to rotate relative to said first magnetically activated switch and said second magnetically activated switch, whereby depending on the position of said magnet either none, one, or both of said first magnetically activated switch and said second magnetically activated switch are activated and wherein as the magnet rotates about the sensing axis relative to said first magnetically activated switch and said second magnetically activated switch, a rotational direction of said sensing follower gear can be determined by monitoring a sequence of the first state and second state of said first magnetically activated switch and said second magnetically activated switch.

34. (previously presented) A meter register as claimed in claim 33, wherein said first magnetically activated switch and said second magnetically activated switch are reed switches.

35. (previously presented) A meter register as claimed in claim 34, wherein said reed switches are electrically coupled to a microprocessor for determining a direction of rotation of said magnet.

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36. (previously presented) A meter register as claimed in claim 30, further comprising a detection switch for detecting tampering of said register, whereby when said tampering switch is activated through tampering a fixed period of time, said register emits a signal that said register has been tampered with.

37. (previously presented) A meter register as claimed in claim 30, further comprising a magnetically activated switch attached to said body wherein when a magnetic field activates said magnetically activated switch for a fixed period of time, said register emits a signal that said register has been tampered with.

38. (previously presented) A meter register as claimed in claim 29, having a metallic body attached to a clear face to form a sealed internal chamber via an elastomeric sealing member, said sealed internal chamber receiving said register body.

39. (previously presented) A meter register as claimed in claim 38, wherein said internal chamber is maintained at a pressure of minus 9 atmospheres.

40. (previously presented) A meter register as claimed in claim 39, further comprising a microprocessor contained within said chamber, wherein said microprocessor is electrically coupled to said antenna.

41. (currently amended) A meter register as claimed in claim 29, further comprising an ~~An~~ antenna adapter comprising a circular metallic ring, a first electrically conductive sheet, and a second electrically conductive sheet axially spaced from said second electrically conductor sheet and a cable electrically connecting said metallic ring and said first electrically conductive sheet and said second electrically conductive sheet, wherein said metallic ring is adapted to be secured to an exterior portion of a meter register.

42. (currently amended) An antenna adapter-meter register as claimed in claim 41, further comprising an electric insulator sandwiched between said first electrically conductive sheet, said second electrically insulating sheet, and said first electrically conductive sheet, said second electrically conductive sheet, said metallic ring, and said cable are surrounded by electrically insulating waterproof material.

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43. (currently amended) ~~An antenna adapter meter register~~ as claimed in claim 41, wherein said cable is coaxial cable.

44. (previously presented) A utility meter, comprising:
a meter body having a chamber through which material passes;
a measuring unit contained within said chamber, said chamber comprising a rotating member, said rotating member having a magnetic member; and
a sealed register attached to said chamber, said register comprising:
a register body having a rotatable drive shaft coupled thereto;
a magnet attached to said drive shaft and coacting with said magnetic member;
a drive gear attached to said drive shaft, at least one follower gear rotatably attached to said register body and coupled with said drive gear;
an antenna, comprising a first electrically conductive sheet, a second electrically conductive sheet, and an axially extending leg electrically connected to said first electrically conductive sheet, said first electrically conductive sheet spaced an axial distance away from said second electrically conductive sheet, wherein at least a portion of said register body is sandwiched between said first electrically conductive sheet and said second electrically conductive sheet; and
a metallic body attached to a clear face to form a sealed internal chamber, said sealed internal chamber receiving said register body.

45. (previously presented) A meter as claimed in claim 44, wherein said register transmits periodically or nonperiodically via said antenna signal identifying a meter code and utility consumption.

46. (previously presented) A meter as claimed in claim 45, wherein said signal identifies an actual odometer meter reading corresponding to said odometer reading of said meter odometer.

47. (previously presented) A meter as claimed in claim 46, wherein said meter issues an alarm if the flow rate exceeds a fixed flow rate or the flow rate does not change over a period of time.

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48-62 (cancelled)

63. (previously presented) A meter register, comprising:
a register body having a rotatable drive shaft coupled thereto;
a drive gear attached to said drive shaft, at least one follower gear rotatably attached to said register body and coupled with said drive gear;
a sensing follower gear rotatably secured to said body and coacting with said drive gear, said sensing follower gear rotates about a sensing axis and a sensing magnet coacting with said sensing follower gear and radially spaced from the sensing axis whereby when said sensing follower gear rotates about the sensing axis, said magnet rotates in a rotating plane about the sensing axis;
a first magnetically activated switch attached to said body spaced an axial distance from said rotating magnet plane, whereby when said magnet and first magnetically activated switch are radially aligned, said first magnetically activated switch is in a first state and when said magnet is not radially aligned with said first magnetically activated switch, said magnetically activated switch is in a second state; and
a second magnetically activated switch attached to said body spaced an axial distance away from the rotating magnet plane, said second magnetically activated switch is spaced circumferentially from said first magnetically activated switch, whereby when said second magnetically activated switch and said magnet are radially aligned, said first magnetically activated switch is in a first state and when said magnet is not radially aligned with said second magnetically activated switch, said second magnetically activated switch is in a second state, and wherein said magnet is adapted to rotate relative to said first magnetically activated switch and said second magnetically activated switch, whereby depending on the position of said magnet either none, one, or both of said first magnetically activated switch and said second magnetically activated switch are activated and wherein as the magnet rotates about the sensing axis relative to said first magnetically activated switch and said second magnetically activated switch, a rotational direction of said sensing follower gear can be determined by a monitoring sequence of the first state and second state of said first magnetically activated switch and said second magnetically activated switch.

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64. (previously presented) A meter register as claimed in claim 63, wherein said magnet is rotatably coupled to said register drive shaft and rotates in a circle in a plane spaced a distance apart from said first and second magnetically spaced switches, wherein the circle is defined into a plurality of regions, said plurality of regions comprising a first region, a second region, a third region, and a fourth region, wherein the first magnetically activated switch and the second magnetically activated switch are in the first state when said magnet is in the first region, the first magnetically activated switch is in the first state and said second magnetically activated switch is in the second state when said magnet is in the second region, said first magnetically activated switch and said second magnetically activated switch are in the second state when said magnet is in the third region, said first magnetically activated switch is in the second state and said first magnetically activated switch is in the first state when said magnet is in the forth region, whereby sensing the position of the magnet in the sequential order of the first region, the second region, to the third region, and to the fourth region indicates movement of said magnet in a first direction and sensing the position of the magnet in the sequential order of the fourth region, to the third region, to the second region, and to the first region indicates movement of the magnet in a second direction, whereby sensing of the magnet direction is indicative of a gear wheel direction and a direction of flow through a meter on which said meter register cooperates.

65. (previously presented) A meter register as claimed in claim 64, wherein the region in which said magnet is located is indicative of a position of a meter main wheel.